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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,313	08/14/2003	Stephen C. Schultz	004.0084	2864
29906	7590	06/06/2005	EXAMINER	
INGRASSIA FISHER & LORENZ, P.C. 7150 E. CAMELBACK, STE. 325 SCOTTSDALE, AZ 85251			MULLER, BRYAN R	
			ART UNIT	PAPER NUMBER
			3723	

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/642,313

Applicant(s)

SCHULTZ ET AL.

Examiner

Bryan R Muller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-13 and 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 14-16 is/are rejected.
- 7) ☐ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings were received on 3/09/2005. These drawings are accepted by the examiner.

### ***Claim Objections***

2. Claim 14 is objected to because of the following informalities: The preamble of the claim is unclear. "In a chemical mechanical wafer processing apparatus" should be changed to "A chemical mechanical wafer processing apparatus comprising:".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The disclosure that, "the light transmission medium is trimmed" is unclear whether the applicant is claiming the method of trimming the medium to make it flush with the pad or if the pad is already trimmed to create the final product (in which case, this claim would contradict claim 14).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 4 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al (6,599,765) in view of Truer et al (6,146,242).

7. In reference to claim 1, Boyd discloses an apparatus (figure 6) for providing a signal port in a polishing pad for optical endpoint detection that comprises a pad (120) having at least a first aperture therethrough, a platen (128) for supporting said pad, said platen having a top surface and at least a second aperture therethrough, a substantially transparent plug including at least a first section (156) and at least a second section (132), the first section positioned substantially within the first aperture and the second section positioned substantially within the second aperture, the second section being partially hollow and a light transmitting and receiving probe (154 in fig. 6, 112 in fig. 1) having a first portion and a second portion, the first portion having a diameter larger than the second portion and the second portion being adapted to fit within the hollow section of the substantially transparent plug. The light transmitting and receiving probe that is commonly known to the art is shown in figure 1 as having a first portion and a second portion, the first portion having a diameter larger than the second portion.

Because there is nothing disclosed in the specification to alter the light transmitting and

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receiving probe of prior art, it is assumed that the same probe is used in Boyd's invention and is shown in figure 6 with the second portion of larger diameter cut out of the figure. It is also not particularly disclosed in the specification that the first section of the probe is to fit within the hollow section of the transmissive plug, but it is clearly shown in figure 6 that the upper portion of the probe is within the hollow section. Boyd, however, fails to disclose that the second portion of the probe is positioned flush with the top surface of the platen. Treur discloses a CMP polishing apparatus with a transparent plug and light transmitting and receiving probe (fiber array 50) located within the platen (4) and polishing pad (7), wherein the surface of the probe is positioned flush with the top surface of the platen (Figure 6). This positioning will place the probe as close as possible to the surface of the work piece being polished while still protecting the probe within the platen, which is generally made of a harder material than the polishing pad, so that there is a minimal distance that the light signal needs to travel, reducing possibility of interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the top of the probe so that it is positioned flush with the top surface of the platen, as disclosed by Treur, to protect the probe and minimize the chance of interference with the light signal.

8. In reference to claim 3, Boyd further discloses a plurality of holes (146) for delivering a chemical to the pad.

9. In reference to claim 4, Boyd does not particularly disclose a manifold but does show a single supply line (136) from the fluid dispenser to the platen and as discussed

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supra the platen provides several supply lines to the surface, therefore there must exist a manifold to produce the several supply lines from the first single supply line.

10. In reference to claim 14, Boyd discloses the apparatus, discussed supra, comprising a polishing pad (120) having a top surface, a platen (128) for supporting the polishing pad, a manifold for delivering a chemical to the platen, an upper polishing module (104) configured to position a work piece substantially in contact with the polishing pad supported by the platen and a light transmission medium (156) for transmitting and receiving light to and from the work piece, one end (132) of the transmission medium having a hollow portion for receiving a light transmitting and receiving probe (154), thereby providing a light transmitting and receiving probe in close proximity to the work piece. Boyd does not particularly disclose a manifold but does show a single supply line (136) from the fluid dispenser to the platen and as discussed supra the platen provides several supply lines to the surface, therefore there must exist a manifold to produce the several supply lines from the first single supply line. Boyd, however, fails to disclose that the other end of the medium is flush with the top surface of the polishing pad. Treur discloses the a CMP polishing apparatus with a transparent plug and light transmitting and receiving probe, as discussed supra, wherein the height of the transmission medium (view port, 53) is adjustable to ensure that the top of the transmission medium is flush with the top surface of the polishing pad and Treur teaches that trenching (an undesirable effect) can be caused in the wafer if the surface of the transmission medium and the surface of the polishing pad are not equal (col. 2, lines 53-55). Therefore, it would have been obvious to one of ordinary skill in the art at

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the time the invention was made to set the top of the transmission medium so that it is positioned flush with the top surface of the polishing pad, as disclosed by Treur, to prevent trenching in the wafer. Neither Boyd nor Treur disclose that the end of the medium initially extends above the top of the polishing pad and is severed to position the severed end flush with the top surface of the polishing pad prior to initiation of a polishing operation but this portion of the claim appears to be a product by process step and a transmission medium being positioned flush with the surface of the polishing pad, by any process, would function in the same way as one that is set flush using the steps in the product by process step of the claim, thus, the obvious combination of Boyd and Treur is a proper rejection over the claim.

11. In reference to claim 15, it would further be obvious that the light transmission medium may be used as a registration guide for positioning the pad on the platen because the light transmission medium will be the only part of the apparatus extending above the platen, so the polishing must be positioned so that the light transmission medium is within the aperture in the polishing pad or the apparatus would not function properly because the polishing pad would not have a substantially planar surface and the light transmission medium would be covered by the polishing pad and would not be able to transmit light to and from the work piece.

12. In reference to claim 16, the obvious combination of the Boyd and Treur inventions, as discussed in reference to claim 14, discloses the apparatus as discussed supra. Again, the portion of claim 16, that discloses that an end of the light transmission medium is trimmed to be substantially flush with the top of the pad appears to be a



product by process step and transmission medium being positioned flush with the surface of the polishing pad, by any process, would function in the same way as one that is set flush using the steps in the product by process step of the claim, thus, the obvious combination of Boyd and Treur, as discussed supra, is a proper rejection over the claim.

13. Claims 2 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al (6,599,765) in view of Truer et al (6,146,242) as applied to claim 1 and further in view of Tolles et al (5,738,574).

14. In reference to claim 2, the obvious combination of Boyd and Treur disclose the apparatus as discussed supra, but fails to disclose that the platen is constructed of non-metallic material. Tolles discloses a CMP apparatus and discloses that the slurry supply tube and other exposed parts of the slurry dispenser should be composed of a material such as Teflon (a non-metallic material), which is resistant to corrosive slurry (col. 36, lines 5-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make any parts that will come in contact with the slurry, such as the platen out of the same material as the slurry resistant material of the slurry dispenser, as taught by Tolles, to prevent corrosion of the parts to extend the functional life of the apparatus and reduce costs of replacing parts in the apparatus.

15. In reference to claims 5-7, as discussed supra, it would be obvious to make any parts that will come into contact with the slurry out of Teflon. This will include the platen



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and the manifold; thus, the entire exteriors of the platen and manifold will be made of non-metallic materials.

16. Claims 2, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al (6,599,765) in view of Truer et al (6,146,242) as applied to claim 1 and further in view of Ishida et al (5,584,750).

17. In reference to claim 2, the obvious combination of Boyd and Treur disclose the apparatus as discussed supra, but fails to disclose that the platen (turn table) is constructed of non-metallic material. Ishida discloses a CMP apparatus wherein the platen is made of carbon reinforced plastic (non-metallic material) and teaches that the carbon reinforced plastic platen is advantageous over traditional metal platen because it is only a small fraction of the weight of the traditional metal platens (col. 3, lines 24-34) and provides many advantages over traditional metal platens (col. 2, lines 20-31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the platen out of a carbon reinforced plastic to reduce the weight and provide all of the benefits taught by Ishida.

18. In reference to claims 5 and 6, it would be obvious to construct the entire platen (including the exterior) out of carbon reinforced plastic, as discussed supra.

### ***Response to Arguments***

19. Applicant's arguments, see Applicant's Arguments or Remarks, filed on 3/9/05 with respect to the rejection(s) of claim(s) 2 and 5-7 under 35 USC § 103 have been fully

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considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Tolles et al.

20. Applicant's arguments, see Applicant's Arguments or Remarks, filed on 3/9/05 with respect to the rejection(s) of claim(s) 2, 5 and 6 under 35 USC § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Ishida et al.

### ***Conclusion***

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pant et al (5,762,536) discloses a CMP apparatus with optical sensors that may be positioned flush with the surface of the platen, Koike et al (PCT/JP00/05762, English equivalent 6,544,104 provided) discloses a CMP apparatus with a transparent plug that is positioned flush with the top surface of the polishing pad and Satake et al (6,012,967), Li et al (6,254,453), Vanell (5,743,788) and Mullins (5,527,424) all disclose CMP apparatus' with a platen and/or manifold that is either coated or completely made of non-metallic materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan R Muller whose telephone number is (571) 272-

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4489. The examiner can normally be reached on Monday thru Thursday and second Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J Hail III can be reached on (571) 272-4485. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BRM BRM  
5/19/2005



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